DOCUMENT RESUME

ED 296 287 CS 009 193

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TITLE Directing Prose Learning with Analogical Study Guides.
PUB DATE Apr 88
NOTE 14p.; Paper presented at the Annual Meeting of the American Educational Research Association (New Orleans, LA, April 5-9, 1988).
PUB TYPE Speeches/Conference Papers (150) -- Reports - Evaluative/Feasibility (142) -- Reports - Research/Technical (143)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Classroom Techniques; Educational Research; Higher Education; Learning Processes; *Learning Strategies; *Study Guides
IDENTIFIERS *Analogies; Analogue Models; *Prose Learning

ABSTRACT

A study compared the relative effectiveness of analogical study guides, essay writing, and self-generation of questions in learning factual information. The subjects, 31 female undergraduate English education majors at the University of Georgia (who had already demonstrated their competence to complete the experiment), read three pairs of encyclopedia articles, each pair consisting of a passage describing a familiar sport and a passage describing an analogous but unfamiliar sport. The subjects used one of the three study methods being tested to help them learn about one pair of sports at each of three study sessions. The experimental design included a pretest and a recognition test taken three days after completion of the study. Results indicated that performance on test items that had been studied with study guides was superior to performance on other test items. Of the two remaining study methods, essay writing was superior to self-questioning. Implications from this study are that guide materials serve two functions: (1) they focus attention on material to be learned; and (2) they provide practice in tasks resembling final tests. Twenty-seven references are attached.) (MHC)

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DIRECTING PROSE LEARNING WITH ANALOGICAL STUDY GUIDES

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American Educational Research Association
New Orleans, April 5, 1988

CS009193

Directing Prose Learning with Analogical Study Guides

College teachers typically engage their students in a range of study activities that they believe will foster students' learning of course material. Sometimes the activities are structured so that they clearly indicate to students what is to be learned and how learning is to be demonstrated. More often, however, assignments are made that leave students to determine for themselves the significance of studied material and to guess how they should prepare for demonstrating learning. The present research tested the effectiveness of one kind of structured study activity to accompany assigned reading, completing an analogical study guide (Bean, Singer, Cowan, 1985), by comparing its learning outcomes with the learning outcomes of two unstructured activities commonly assigned to accompany reading, essay writing and self-questioning.

Research on study guides (Bean, Singer, & Cowan, 1985; Berget, 1973; Estes, 1973; Sanders, 1967) has produced mixed results, though guide material does appear to be helpful when constructed to guide thinking in ways that simulate the kind of thinking expected as an outcome of its use. Bean and colleagues (1985/1987) have reported that the use of study guides that provided analogies resulted in increased learning for low achieving biology students. They concluded that analogical study guides offer a bridge from familiar experience to new concepts for which students lack adequate knkowledge to grasp.

Among student initated study activities to accompany reading, none have been more widely recommended in recent years than having students compose brief essays or generate self questions. Notwithstanding strong assertions about writing's value as an instructional aid (Beach & Bridwell, 1984; Flower 1979; Odell, 1980; Page, 1974; Wittrock, 1983), researchers (e.g. Bean & Steenwyk, 1984; Hare, 1985; Newell, 1984; Taylor & Beach, 1984) have offered no firm evidence that writing activities are any more effective than other study activities for fostering prose learning. Having students generate their own questions about texts under study (Robbins, 1957; Robinson, 1946; Stauffer, 1976) finds support in research showing that questioning oneself during study results in increased constructive and integrative discourse operations (Hayes, 1987) and increased learning from texts (Duell, 1978; Dansereau et.al., 1974; Frase & Schwartz, 1975).

If prudent choices are to be made among these study activities teachers have to take into account the effectiveness of the activities relative to one another. The present research was an effort toward determining the relative effectiveness of these study tasks for learning factual information.

Method

Subjects

The subjects were 31 undergraduate women majoring in English education at the University of Georgia. As part of their coursework, the subjects had received instruction and demonstrated competence in setting instructional objectives,

formulating questions, and constructing tests and test-like instructional materials. Further, as a condition of advancement to the upper division, the students had demonstrated competence in composing a variety of expositional patterns, including compare-contrast essays. Thus the students had demonstrated the competence needed to perform satisfactorily the tasks of the experiment.

Materials

The materials of the experiment included three pairs of encyclopedia articles and a study guide to accompany each pair of passages. Each pair of passages comprised a passage describing an unfamiliar athletic game and a passage describing a familiar analogous game. The analogous pairs of passages were adapted so that they described in parallel fashion the games of cricket and baseball, rugby and football, and jai-alai and handball. The format was identical for each. The first section presented general information about the game by identifying the object of the game, number of players, and the way in which a winner is determined. The next section described the playing surface, equipment used, and scoring. Another section then explained turn taking and how the game begins and ends. Finally, each passage discussed the rules of the game, which included time-outs, legal and illegal procedures, and penalties. Since the passages were intended only to introduce the games, the rules were discussed in general terms, rather than in exhaustive detail.

The study guides also followed an identical format. The first section consisted of a list of terms from the unfamiliar sport to be matched with the appropriate terms from the analogous familiar sport. An item-completion section followed asking for information concerning number of players, equipment, rules and scoring. The next section contained a list of rules to be matched with the appropriate sport. The answers "both" and "neither" were included. The final section, in chart format, contained five general statements and asked for an explanation appropriate to each.

Procedure

One week prior to engaging students in the study tasks, students' knowledge of the familiar games was assessed. This measure was taken with a 75-item true-false test in which students indicated their level of confidence for each response. Responses for which a student indicated high confidence counted twice as much as responses for which a student indicated low confidence.

The students were randomly divided into three groups for comparing the three groups in a restrictively randomized quasi-experiment under a 3 (treatments) x 3 (texts) factorial design. Treatments and texts were both within-subjects factors. The three treatments were administered without time limits during two-hour class sessions. The order of treatments was the same for all students, but texts rotated to a different group at the second and third class sessions.

At the first session students were assigned the study-guide task. For this task students were issued a pair of passages and an accompanying study guide, and without instruction beyond clarification of the requirements for completing the guide, the students were directed to try to learn as much as they could about the foreign game by studying the passages and working through the accompanying materials.

At the second session the students' task was to formulate study questions. Prior to receiving the passages, students were given suggestions for studying the material through self-questioning. The suggestions were to try to identify the main points of information in each paragraph; to make up questions about this information; to include questions about how the information compares with information about the familiar game; to review the questions and try to answer them from memory; and quickly to reread to confirm the correctness and adequacy of the answers.

At the third session, the students were assigned to write a compare-contrast description of the two games presented in the passages issued to them. Before starting the task, students were given a quick refresher lecture on two basic approaches to writing compare-contrast essays. One approach was the so-called continuous approach, by which the games could be described separately on each feature compared. The other approach was the so-called discontinuous approach, by which the games could be directly compared throughout the composition.

Three days after all the treatments had been administered, the students took a 150-item recognition test. The items were equally divided among the three pairs of games studied. The tests generally followed the same sequence for questioning students about the games as the passages did for describing the games.

Results

Overall performance on the posttest ranged from 72 to 132 raw score points. Performance on the jai-alai-handball items ranged from 26 to 42 points, on the cricket-baseball items from 22 to 44 points, and on the rugby-football items from 27 to 44 points. Mean performance on these items by subjects who studied the texts by the three study tasks is shown in Table 1.

The results were compared with an analysis of covariance in which the pretest scores were the covariates. The analysis revealed no significant interaction effects, nor any main effect due to text. The analysis did show main effects associated with the study tasks, F (2,83)=7.027, p <.001. The study tasks accounted for approximately 17% of the variance, constituting a large effect size due to treatment.

Performance on test items from texts that had been studied with study guides was superior to performance on items studied by self-questioning (t, [30]=4.63, p.<.001, ES=.88) and by composing compare-contrast descriptions (t,[30]=1.95, p <.058, ES=.46). Between the items studied by the latter two study tasks, performance on items studied by composing comparison-contrast descriptions was superior (t,(30)=1.79, p .081, ES=.48).

Discussion

How to have students make use of what they already know in learning new subject matter is a continuing concern among educators. Study activities for addressing this concern may be either activities that are carefully structured by the teacher or activities that have students largely determine for themselves which of the material studied is significant and how that material relates to their existing knowledge. The results of the present experiment indicate that superior prose learning can be expected with the assignment of study activities that are carefully structured for the learners.

Although the assessment of learning included no problem-solving or transfer tasks, it did provide a measurement of learning factual information. In terms of learning factual information, the results are consistent with the findings of previous research. The present investigation found, as did King, Lipsky, & Biggs (1984), that a composition task results in better test performance than a self-questioning task. In the present investigation, however, a slightly larger effect size was observed in the contrast between the effects of composing and self-questioning tasks, perhaps due to the difference in the two investigations' writing tasks. The results are also consistent with other research that has found positive effects associated with providing students study objectives and having them respond to study questions (Duell, 1978/1984; McGraw & Groteluesch en, 1972), as well as with having students complete study guides (Bean, Singer, & Cowan, 1985; Vacca, 1977; Estes, 1973) to

accompany reading. A conclusion drawn from that area of research seems also to apply here: Study tasks that force inspection behavior results in improved learning of factual information. Further, guide materials inform students about what they are expected to learn as they engage students in tasks that resemble the final test. As has been reported of experiments involving similar test-like study tasks in which intentional learning of difficult material was expected (Anderson & Biddle, 1975; Hartley & Davies, 1976), the guide materials very likely alerted students to the demands of the final test of learning. The results of the study imply, then, two distinct functions served by guide materials. First, they focus on material to be learned, and, second, they provide practice in demonstrating the learning of that material as the teacher would have it demonstrated. The differential advantages of these two functions remain to be sorted out through further study.

Table 1

Mean performance on test items from tests studied by composing, self-questioning, and completing study guides.

	Study Task			
Text	Composing	Self-Questioning	Study Guide	
Rugby	34.91 (3.81)[a]	33.10 (3.32)	34.00 (5.85)	102.90 (13.17)
Jai-alai	32.50 (3.07)	29.60 (2.27)	34.18 (4.58)	96.48 (11.64)
Cricket	30.00 (4.06)	29.18 (5.02)	36.00 (5.83)	94.94 (17.22)
	97.65 (12.29)	91.74 (12.15)	104.13 (15.96)	

[a]Standard deviations are in parentheses

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